



Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Johns-Manville Site Profile

Site Description:

Asbestos dump and ponds

Site Size: Approximately 120 acres

Primary Contaminants:

Asbestos, lead, chromium, arsenic, and volatile organic compounds (VOCs)

Potential Range of Health Risks:

Increased incidence of lung cancer and other respiratory disorders

Nearby Population:

200 residences within one mile

Ecological Concerns:

Wildlife along Lake Michigan and Illinois Beach State Park

Year Listed on NPL: 1983

EPA Region: 5

State: Illinois

Congressional District: 10

Success In Brief

EPA and State Combine Tough Enforcement with Careful Oversight

At the Johns-Manville Superfund site, manufacturing wastes laden with asbestos and toxic substances were dumped for more than 70 years into pits forming an enormous landfill. Industrial wastewater pooled into acres of settling ponds. Airborne asbestos endangered workers and threatened ecological habitat in an adjacent state park and along Lake Michigan. With help from the State of Illinois, the U.S. Environmental Protection Agency (EPA) negotiated with the Manville Service Corporation for a comprehensive cleanup of the site. The company was not always cooperative, however, and incurred substantial penalties for violating cleanup agreements. Vigorous enforcement and constant oversight ensured the successful remediation of this site.

Overall efforts included:

- Covering a three million ton landfill of asbestos, heavy metals, and other contaminants with a multi-layer cap;
- Closing several wastewater settling ponds and placing a 6-foot layer of limestone along perimeters of active ponds; and
- Cleaning up three additional areas of contamination discovered after completion of the original plan.



Pipes, shingle rolls, and manufacturing waste were used to build up the side walls of a 33-acre settling basin where asbestos fibers formed a sludge.

The Site Today

Schuller International purchased Manville and continues to manufacture construction materials at the same location outside Waukegan, Illinois. EPA is monitoring the landfills 24-inch cap which has been planted with new vegetation. Old wastewater settlement ponds were filled with sludge and retired from use. Measures were taken to prevent wind and water erosion of the interior slopes of the ponds that remain in use. On-site air and surface water, as well as ground water down-gradient from the site, meet state and federal safety standards.

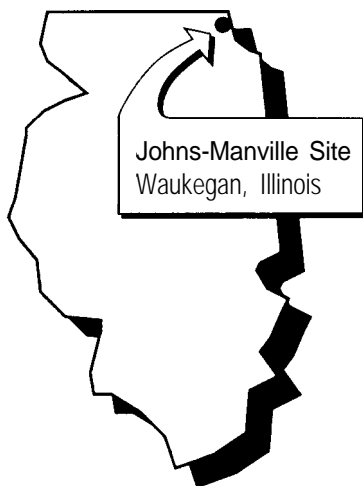
A Site Snapshot

The Johns-Manville site covers approximately 120 acres and is bordered by Lake Michigan and a state park to the east and north, respectively. The City of Waukegan borders the site to the east with a population of 75,000. Approximately 200 residences are within one mile of the site.

In 1922, the Manville Service Corporation began producing construction materials including low-temperature pipe covering, asbestos roofing products, cement pipe, cut gaskets, wallboard, and glass fiber shingles. Almost all of the wastes generated since 1922 have been disposed of on site.

The plant continues to produce construction materials, but asbestos and lead are no longer used in manufacturing these materials.

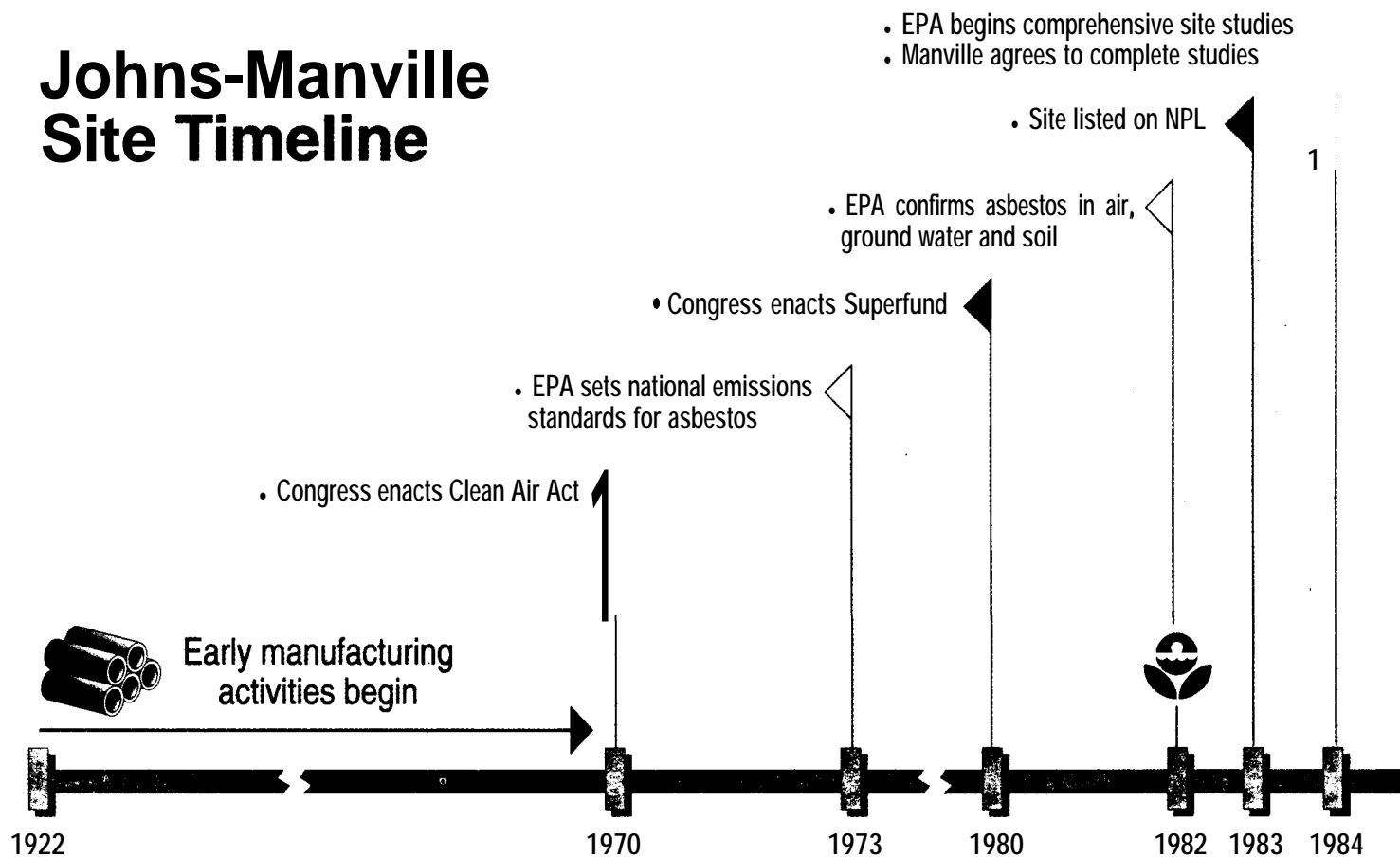
EPA studies found elevated levels of asbestos in the air and



ground water on the site and in Lake Michigan, as well as other hazardous chemicals in the ground water. The primary contaminants included asbestos, lead, arsenic, chromium, and volatile organic compounds.

Asbestos fibers are easily dispersed by the wind; inhalation of these fibers causes a wide variety of respiratory problems, including lung cancer. Those potentially most affected were the 600 Manville employees and visitors who frequented the adjacent state park or beaches for recreation.

Johns-Manville Site Timeline



Asbestos Landfill Rises to 20 Feet, Prompting EPA Response

Asbestos Dumping Lasted 67 Years

In 1922, the Johns-Manville Sales Corporation opened a manufacturing plant for the fabrication of cement pipe and asbestos roofing felt. Production waste was regularly dumped in disposal pits that currently encompass approximately 70 acres. Over the years, sections of the asbestos landfill reached over 20 feet in height.

A wastewater facility encompassed an additional 50 acres, and consisted of several large ponds where asbestos and fibers settled out of industrial wastewater. As the ponds filled, the fibers were dredged and placed in the ever-

growing landfill. Fabrication waste such as shingle rolls and asbestos-containing pipes were used to build up the side walls of the ponds that abutted the landfill.

**“This place was an
engineering wonder.”**

— Brad Bradley,
EPA Remedial Project
Manager

The landfill in turn served as a dyke for the wastewater system, since all the ponds were eventually interconnected with the landfill. Retired ponds were

filled with sludge and became dry areas, contributing to dust in the air under windy conditions.

Manville First Regulated under Clean Air Act

In 1970, Congress passed the Clean Air Act, establishing EPA's first asbestos abatement program. The Act required EPA to set National Emission Standards for Hazardous Pollutants (NESHAPs). In 1971, EPA determined asbestos to be a hazardous air pollutant because of the fibers' ability to cause serious respiratory disorders, lung cancer, and death. In 1973, EPA issued regulations to

• EPA selects cleanup approach after public comment

- > • Manville signs agreement with EPA, begins work plan
- Manville pays \$38,000 penalty for late submission of cleanup plan
- Manville begins cleanup

• EPA, state discover additional contaminated areas

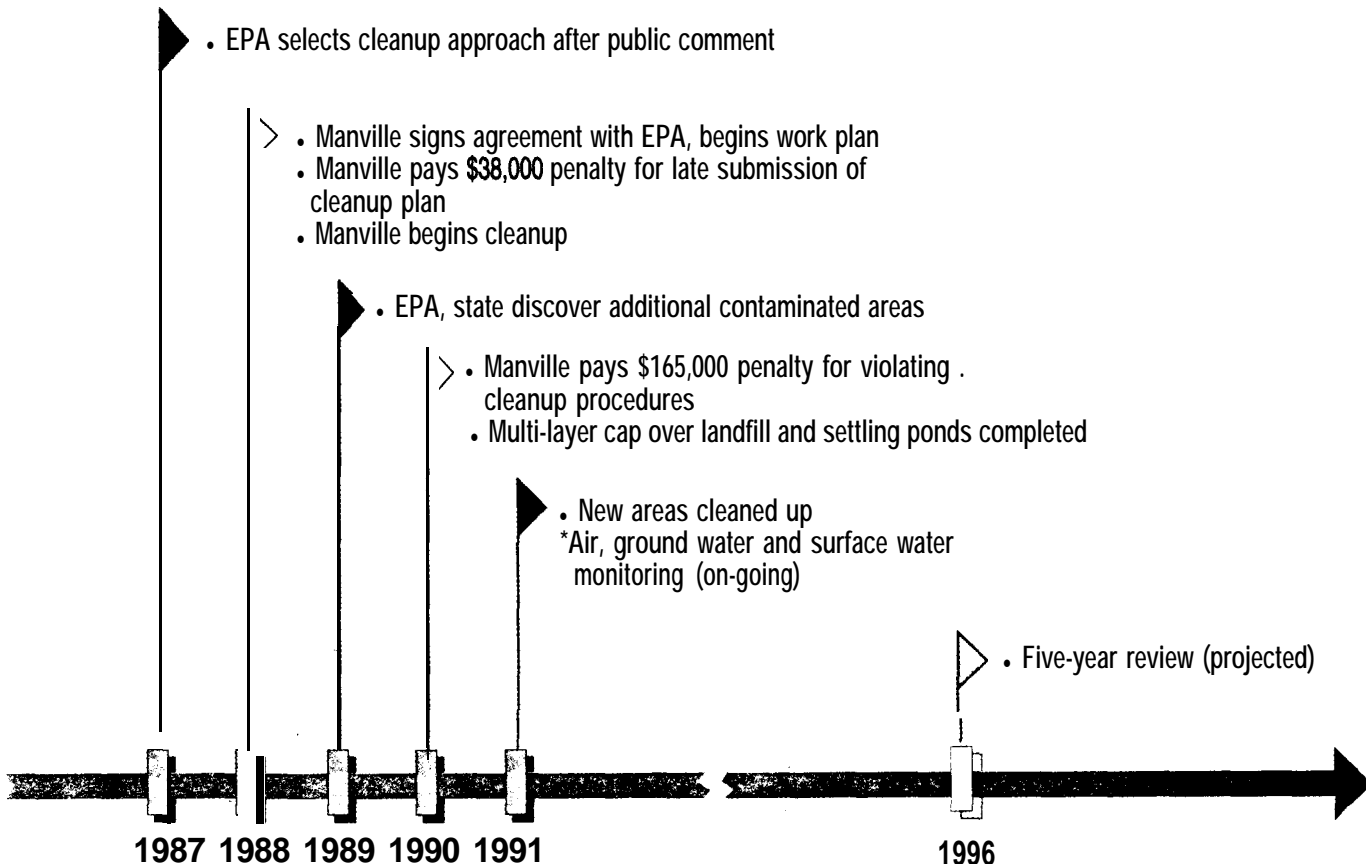
- > • Manville pays \$165,000 penalty for violating cleanup procedures
- Multi-layer cap over landfill and settling ponds completed

• New areas cleaned up
*Air, ground water and surface water monitoring (on-going)

• Five-year review (projected)

1987 1988 1989 1990 1991

1996



control asbestos emissions from manufacturing, milling, roadway surfacing and demolition projects.

Manville's waste disposal practices first became a concern in 1973 when the Illinois Institute of Technology Research conducted air sampling at the site under NESHAP's authority. Investigators found no conclusive evidence of asbestos in the air at that time, but worker exposure was not measured. Asbestos tends to break down into a dust of tiny fibers that remain suspended in the air for long periods of time and are easily inhaled. Because of their durability, these fibers can remain in the body for years. In general, asbestos related diseases have a latency period of 20 to 40 years after exposure.

In 1980, Congress established the Superfund program within

EPA with a primary goal of cleaning up the nation's hazardous waste sites. Whenever possible, EPA locates those responsible for the site contamination and tries to negotiate the use of private resources for cleanup.

A 1985 Manville report counted more than 3 million tons of contaminants at the site

At the State of Illinois' request, EPA collected more air samples in 1982, this time finding elevated levels of asbestos in the air on site and downwind. Additional studies revealed arsenic and asbestos in ground water, and lead and asbestos in the roadways, sludge and waste materials. Within a year, EPA officially

added the site to the National Priorities List (NPL), EPA's roster of hazardous waste sites requiring cleanup under the Superfund program.

EPA Compels Manville to Cover 3 Million Ton Landfill

In 1984, EPA began comprehensive site studies to determine the nature and extent of contamination at the site. In June, EPA and Manville signed an agreement, called an administrative order on consent (AOC), under which the company agreed to complete these investigations.

A 1985 Manville report counted more than 3 million tons of asbestos, lead, chromium, xylene, and other contaminants at the site. Several approaches were proposed to clean up the site and presented to the local community.

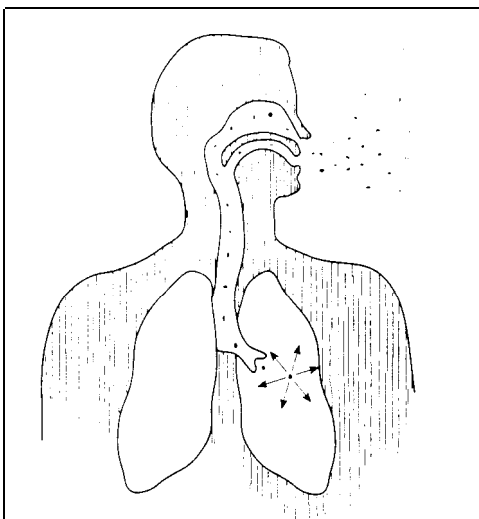
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Asbestos

"Asbestos" is the name for a group of naturally occurring minerals that separate into strong, microscopic fibers that are heat resistant, odorless, and very durable. These qualities have made asbestos extremely useful to the construction industry.

Asbestos has been used for thermal and acoustical insulation, fire-proofing, roofing and flooring felts, vinyl floor tiles, pipe insulation, cement piping and in friction products such as brakes for trucks and automobiles. Friable (easily crushed or pulverized) asbestos emits microscopic fibers into the air

when even slightly disturbed. These fibers are easily inhaled and can cause a host of respiratory disorders.



Lung cancer is the most frequently seen asbestos-caused disease and is more likely to occur if the exposed person is a smoker. Asbestos also causes asbestosis, a chronic disease of the lungs that makes breathing progressively more difficult and can lead to death.

EPA has taken numerous actions since 1971 to regulate the manufacture, use, removal, transportation and disposal of asbestos-containing products and materials. EPA maintains a toll-free number for citizen concerns, questions and complaints at 1-800-368-5888 (in Washington, D.C. call 557-1938).

Asbestos Landfill Rises to 20 Feet

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In June 1987, following a period of public comment, EPA selected the remedy for the site consisting of the following actions: waste materials in the landfill were to be "capped" with a 24-inch protective cover of sand, clay, and top soil. Several of the wastewater settling ponds also would be closed and covered. The multilayer covers would be monitored to ensure that no asbestos reached the surface. To prevent public access to the site, warning signs were to be posted and a fence constructed on the eastern site boundary, neighboring Lake Michigan.

A 6-foot layer of limestone "riprap" was to be imbedded in the interior slopes of the ponds that remained in active use to prevent wind and water erosion.

To further guarantee the success of the cleanup efforts, EPA would monitor ground and surface water for 30 years, and continue air monitoring for at least 15 years. In addition, EPA would review the site in five years to determine the effectiveness of the protective covers and other measures.

Cleanup Violations Result in Penalties

In March 1988, EPA, the State of Illinois, and the Department of Justice successfully negotiated another agreement, called a consent decree, requiring Manville to conduct the cleanup

under EPA and state supervision. The company also agreed to reimburse EPA for past cleanup costs of \$153,000. Manville's cleanup plans, however, were submitted late to EPA and did not incorporate some of EPA's previous recommendations. EPA fined Manville \$38,000, which the company subsequently paid.

Manville began the cleanup under a revised workplan in late 1988, but once again violated the terms of the consent decree. EPA halted their work in January 1989 after discovering that Manville graded more of the surface than allowed in the cleanup plan. Preparation of the landfill for the protective cover was intended to flatten only the slopes that would be difficult to maintain in the future, while minimizing the potential for asbestos releases to the air. But Manville moved an extra 25,000 cubic yards into a settlement pond, risking a dangerous air release.



Trees and other vegetation covered many acres of the landfill before the cleanup; investigations revealed 3 million tons of asbestos wastes largely hidden from view.

At other times, Manville's actions caused visible emissions of asbestos near Lake Michigan. The company then failed to halt work after the emissions occurred. In response, EPA filed a lawsuit against Manville, seeking penalties for the cleanup violation. The suit was eventually settled out of court, and Manville paid a \$165,000 fine in 1990.

Cleanup Complete, Monitoring Continues

Under EPA supervision; the cleanup proceeded to completion in May 1990, as required by the consent decree. During the course of the cleanup, however, the Remedial Project Manager suspected that asbestos had spread much further around the site. The state provided quick sampling and analysis, and the community was informed that Manville had much more work to do. The cleanup plan was

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Asbestos Landfill

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expanded to include two extra wastewater ponds, a beach area, a roadway, an old marina, and an off-loading railroad station. These areas were promptly addressed, and cleanup was completed in August 1991.

In total, Manville spent \$15 million remediating the site, and paid \$203,000 in penalties for violating cleanup agreements. The only activities remaining are maintenance of the multi-layer cover, and continued air, surface water, and ground water monitoring. In 1996, EPA will conduct a five-year review of the site to confirm that cleanup standards are still maintained.

Success at Johns-Manville

EPA used Superfund enforcement authorities to compel Manville to cooperate in cleaning up the site. With assistance from the Department of Justice, EPA exacted penalties exceeding \$200,000 from Manville for violating terms of their negotiated settlement. Manville later

completed work at the site and voluntarily cleaned up newly discovered areas of contamination. The state provided valuable oversight of cleanup operations, as well as timely sampling and analysis of additional asbestos-contaminated areas discovered during the cleanup.

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